

STAUFFER ROAD BRIDGE
(Bridge No. F26-06)
Stauffer Road, spanning Israel Creek
Walkersville Vicinity
Frederick County
Maryland

HAER NO. MD-82

HAER
MD
11-WALKERSVILLE
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

HISTORIC AMERICAN ENGINEERING RECORD

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Location: Stauffer Road spanning Israel Creek
Walkersville Vicinity
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UTM: 18.298060.4371040
Quad: Walkersville, MD., 1:24,000

Date of Construction: ca. 1930

Architect/Engineer: Unknown

Present Owner: Frederick County Department of Public Works
118 North Market Street
Frederick, Maryland 21701

Present Use: Vehicular bridge
Proposed for removal in 1996/1997.

Significance: This bridge is associated with the development of transportation in Frederick County. Metal truss bridges were the most popular bridge form in the county between the 1870s and 1930s, facilitating vehicular movement throughout the developing region. These bridges, once common throughout rural Maryland, now represent an increasingly rare example of a modest, yet vital engineering structure found throughout the rural areas of the state.

Project Information: The bridge is being removed to a new location, probably for use as a pedestrian bridge. It is currently structurally insufficient for its vehicular load. To mitigate the adverse effect of removal of the bridge from its original location, the State Historic Preservation Office stipulated documentation of the bridge in a narrative format.

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BRIDGE DESCRIPTION

The Stauffer Road bridge is located on Stauffer Road, northeast of the intersection of State Routes 26 and 194. The bridge spans Israel Creek in the vicinity of several historic farmsteads and east of a late twentieth-century housing development on Stauffer Road known as "Discovery." Beyond this development, the Stauffer Road area is rural.

The structure is a single-span, four-panel, steel, pony truss, Pratt, full slope bridge with riveted connections. It does not feature a manufacturer's plaque, so the exact date of construction is uncertain. Judging by the character of its members and its method of construction, however, a date in the early 1930s seems likely. (See below.)

The bridge is 62'-10" long with a 13'-0" roadway and features concrete abutments and stone wingwalls. It is constructed of steel, the manufacturer of which is also unknown as there are no imprints on the steel members. The bridge is composed of two, 16'-0" end panels and two, 15'-1" interior panels, set in a Pratt, hipped configuration. All connections are riveted. The chords and inclined end posts are solid, wide features, revealing the structure's twentieth-century heritage. The main ties are latticed, while the counters are slim paired rods. The stringers and transverse beams are steel, bottom laterals are thin steel rods, and the concrete deck is reinforced with rebars. The handrails and intermediate posts are latticed. In May 1995, at the time of last inspection, the bridge was in fair to poor condition, with severely spalled abutments and concrete deck, and badly deteriorated floor beams.

The bridge is similar in the thickness of its members and details of its deck construction to two other bridges in the county, built in the 1930s.¹ One, located nearby, is a state-owned bridge crossing the Monocacy River at Route 26. This bridge, which retains its manufacturer's plaque, was constructed in 1932 by a contractor. The second bridge, constructed during the same time frame, is located on Route 17 across Catoctin Creek in the vicinity of Middletown. The relative similarity of features between these three bridges suggests that the Stauffer Road bridge may date to the same period.² The 1930s represents the end of the period of metal truss bridge construction in the County, with most bridges constructed between the 1870s and 1930s. For its era, the bridge is typical in its use of steel members, Pratt configuration, and riveted connections.

¹ This comparison was pointed out by Ken Harwood, transportation engineer and local bridge historian with the Frederick County Department of Public Works.

² Likewise, the fact that the bridge is riveted, as opposed to welded, suggests a ca. 1930 date.

MANUFACTURING INFORMATION

There is no indication of any design source for the bridge. In addition to the lack of a manufacturer's plaque, there are no known drawings to indicate the original design source. The most likely scenario for the construction of the Stauffer Road Bridge would have been the assembly of the bridge from a bridge company kit, undertaken either by a bridge company representative or by an independent contractor.³ Local county commissioners would have specified a certain bridge from a bridge company, ordering - via the company's form - a single-span, Pratt, pony truss, riveted bridge. The bridge's various components would have been standardized parts manufactured at a steel plant (channels, plates, bars, etc.) which the bridge company then would have fabricated into bridge parts (posts, struts, chords, etc.). These bridge components would have been cut, machined, and assembled at the shop, then disassembled, and shipped as a kit to the bridge site. The kit would have contained the various bridge sections (with imprints or matchmarks on larger members) and detailed instructions and plans.

SIGNIFICANCE

The Stauffer Road Bridge has local significance for its role in expanding the agricultural economy of Frederick County by connecting remote farm roads with more well-traversed thoroughfares. It is also significant structurally as a local example of a low highway, Pratt, full-slope bridge of the second quarter of the twentieth century.

Historical

The Stauffer Road bridge facilitated the flow of traffic and goods between the Ceresville area and the city of Frederick to the southwest as well as to other markets in a more easterly direction (such as New Market and Baltimore). The bridge is located in the community of Ceresville, a rich farming area named after Ceres, the Greek Goddess of harvest. The major landmark in the community is the early nineteenth-century Ceresville Mill, which stands on the south side of the Libertytown Road at Israel Creek. The mill's builder and owner was General Otho Holland Williams, who owned a 600-acre estate in the area featuring a ca. 1812-1816 house.

The Stauffers were early landowners in the area, along with the Nicodemuses. In addition to the grain mill on the Libertytown Road, a steam distillery was in place in 1858 along the Stauffer road at Israel Creek, just to the west of today's bridge site. The farm closest to the Stauffer Road Bridge is a federal-era farmstead on the south side of Stauffer Road at Israel

³ Conversation with Robert Vogel, former Curator, Division of Mechanical and Civil Engineering, the Smithsonian Institution.

Creek which belonged to H. Nicodemus in 1858. Farms to the east and west of the bridge on Stauffer Road date from the Federal through the Victorian eras.

Structural

Constructed most likely ca. 1930 of steel, the Stauffer Road Bridge is a significant indicator of the metal truss bridge tradition in Frederick County. A truss bridge is defined by Milo Ketchum in his 1920 work, *The Design of Highway Bridges of Steel, Timber, and Concrete* as follows:

A truss is a framework composed of individual members so fastened together that loads applied at the joints produce only direct tension or compression. The triangle is the only geometrical figure in which the form is changed only by changing the lengths of the sides. In its simplest form every truss is a triangle or a combination of triangles. The members of the truss are either fastened together with pins, pin-connected, or with plates and rivets, riveted.⁴

Metal truss bridges began replacing wooden truss bridges nationally, in the 1840s, and, in Frederick County, in the 1870s. The real push for metal truss bridges resulted from the popularization of the railroad, which demanded that heavier loads be carried over waterway spans.

The first all-metal truss bridges were constructed of iron: a combination of cast and wrought iron members being necessary for both compressive and tensile force. In the 1870s, the brittleness of cast iron put an end to its use and bridges came to be built entirely of wrought iron. Wrought iron had both tensile and compressive properties, and could be manufactured more economically.

The Pratt truss, the type seen at Stauffer Road, was patented by Thomas and Caleb Pratt in 1844. It is characterized by a design with vertical compression members and diagonal tension members. It was a particularly popular solution for highway bridges because of its relative ease of construction and strength. For low truss highway bridges spanning from 30 to 80 feet, either the Pratt or Warren types were recommended.⁵

⁴ Milo Ketchum, *The Design of Highway Bridges of Steel, Timber, and Concrete*, New York: McGraw-Hill, Co., Inc., 1920 (2nd edition), p. 103.

⁵ Ketchum, Milo S., C.E., *The Design of Highway Bridges and the Calculation of Stresses in Bridge Trusses*, New York: McGraw-Hill Book Company, 1908, p. 199.

nineteenth century specifically to manufacture iron truss bridges. Many had their origins as foundries, forges, or as local builders with expertise in timber bridge construction, and the majority of bridge companies were located in the northeast and midwest (although Baltimore County had quite a few in the state of Maryland). The companies would manufacture bridge components from individual steel members, assemble the structure to test its strength and durability, then de-assemble and ship the product in a kit to small localities. There, the bridges would either be assembled by company representatives or local contractors. Twenty small bridge companies, mostly out of New York, Pennsylvania, and Ohio, are known to have produced metal truss bridges for Frederick County.⁶

In 1875, the development of steel by the Bessemer process, followed by the advent of the open hearth process, caused the demise of the iron truss bridge and its replacement with steel. Steel was more durable and stronger than iron and as cheap to produce. The transition from iron to steel truss bridges occurred nationally in the 1890s. While some truss bridges in Frederick County are fabricated of steel from that decade, iron truss bridges continued to be built there up until the 1910s. Small bridge companies exploded in growth in the 1880-1910 period to capitalize on the new steel market. The use of steel permitted easier fabrication of truss bridges at the shop site.

Beginning in 1900, however, the small bridge companies felt the pressure of competition from large steel manufacturers, who entered the bridge manufacturing market as a natural outgrowth of their steel manufacturing role. Andrew Carnegie's American Bridge Company was created as a subsidiary of the United States Steel Corporation that same year, and was able to buy up many of the small bridge companies across the country. In later years, other steel giants, such as Bethlehem Steel, entered the bridge design and erection field as well. The participation of the big corporate giants, coupled with standards published by state highway commissions, resulted in the increasing standardization of truss bridge types.

In the 1920s, state highway commissions also developed standards for reinforced concrete bridges and these new spans began replacing the metal truss bridges. By the 1930s, reinforced concrete bridges replaced metal truss bridges as the structure of choice for small, local spans, although rural outposts continued to build the metal trusses through the decade. In the 1940s, steel girder bridges were introduced, and the metal truss bridge for small spans was virtually extinct. It remained popular, and was catapulted into a highly visible art form, however, for monumental river spans in the 1930s and 1940s.

⁶ Maryland Historical Trust Inventory Forms for metal truss bridges in Frederick County.

CONCLUSION

A majority of the surviving metal truss bridges in Maryland are Pratt through and pony truss bridges, of both pin and riveted connections. Nonetheless, these structures are a dying breed. At one time fairly common in Frederick County, there were forty metal truss bridges standing in 1975. Approximately 24 stand today. Six of the County's iron truss bridges; three wood-truss, covered bridges; and one stone arch bridge are listed on the National Register of Historic Places.

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A. Engineering drawings: None.

B. Historic views: None.

C. Interviews:

1. Ken Harwood, Engineer, Frederick County Department of Public Works, Division of Transportation Engineering. Transportation engineer and local bridge historian. June 24, 1996 telephone interview.
2. Robert Vogel, Industrial historian and metal truss bridge scholar. June 28, 1996, telephone Interview.

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E. **Likely sources not yet investigated:** None.

F. **Supplemental material:** None.

